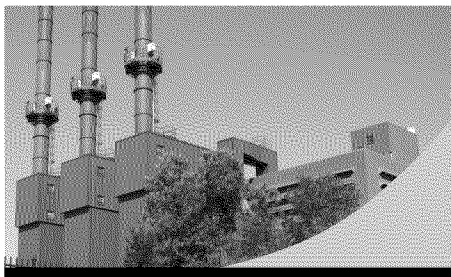

We Energies' generating system

March 2014

COAL

Oak Creek Power Plant

The Oak Creek generating site is comprised of two power plants:
Oak Creek Power Plant (OCPP) and Oak Creek Expansion (OCXP) Units 1 and 2
(See the OCXP fact sheet for information specific to that plant.)

Location:
The Oak Creek generating site occupies 1,000 acres of land on the shore of Lake Michigan, 20 miles south of Milwaukee.

Type of plant:
The Oak Creek Power Plant is coal-based, base-load (typically operating 24 hours a day).

Initial cost:
$246 million

Number of active generating units:
4 steam turbines

Year in service (South plant):

Unit 5: 1959	Unit 7: 1965
Unit 6: 1961	Unit 8: 1967

Generating capacity:
Unit 5: 261 megawatts
Unit 6: 264 megawatts
Unit 7: 298 megawatts
Unit 8: 312 megawatts*

* Unit 8 is Oak Creek's largest turbine-generator unit, measuring 125 ft. long, 28 ft. wide, 31 ft. high and weighing 1,600 tons. The entire turbine and generator are bolted together in one long shaft system. Units 5, 6 and 7 each have two parallel shaft systems with two separate generators.

We Energies' generating system

COAL

Oak Creek Power Plant

Total net generating capacity:
1,135 megawatts

Fuel:
Pulverized coal; natural gas for boiler start-up.

Coal handling:
The Oak Creek generating site uses a shared coal handling and distribution system for OCPP and OCXP. The coal handling information here is specific to OCPP.

Transportation:	Unit train 142 coal cars per train
Storage:	Indoor: 27,500 tons Outdoor: 420,000 tons
Preparation:	16 pulverizers crush coal at 33 tons per hour each

Average coal use:
6,000-6,200 tons daily (depending on system demands)

Air Quality Control System (AQCS)
Advanced AQCS systems were installed in 2012 for $750 million on all four generating units. The AQCS system consists of SCR and WFGD emission control components as noted below.

Selective Catalytic Reduction (SCR)
SCR controls reduce emissions of nitrous oxides (NO_x) by 50 to 60 percent. One SCR was installed for each pair of generating units.

Wet Flue Gas Desulfurization (WFGD)
WFGD controls are reducing sulfur dioxide (SO_2) emissions by more than 90 percent. One WFGD system was installed for each pair of generating units.

Boilers:
(Units 5-8); One per turbine generator.
Height: 18 stories (Unit 8)

Furnace temperature:	2,500 degrees Fahrenheit
Steam temperature:	1,050 degrees Fahrenheit
Steam pressure:	2,400 pounds per square inch

Ash handling:
More than 99 percent of fly ash is removed by electrostatic precipitators. Bottom ash is removed by a hydraulic removal system.

Chimney:
One 368-foot chimney supports all four generating units. Two separate flues inside the stack service a pair of generating units. The chimney discharges a water vapor plume as a result of the new emission-reduction controls.

Cooling system:
The Oak Creek generating site uses a combined cooling water intake system for OCPP and OCXP. Up to 1.56 million gallons (820,000 for OCPP and 740,000 for OCXP) of water from Lake Michigan are used every minute to convert the exhaust steam from the turbines back into water for reuse. The water is returned to the lake.

Control room:
All major functions in the plant are controlled by operators with computer support to continuously monitor and report on pressures, temperatures, flow rates, etc. In addition, the computer aids in start-up, shutdown, load adjustments and information for future reference.